

DOCKET FILE COPY ORIGINAL

18 January 2006

Subject: RM-11306, Comments on

Contact name: George E. Foy, NK4Q, 1603 Harbison Street, NE,
Cullman, Alabama 35055

1-(256)739-3930

Gentlemen,

I would like to register my opposition to RM-11306. My reasons for this are not based solely on the specifics of the petition but are also based on the way it was conceived and brought to its present state.

From the information set forth below it seems that, from its very inception this petition has been heavily skewed in favor of digital interests and that this was deliberate and was orchestrated in such a way that the Winlink system would be the major beneficiary. (Winlink is a system for transferring email over the airwaves using robot transmitters as gateways to the Internet). It should be noted the Winlink system can only be accessed by using a very expensive (upwards of \$1000) controller and that expansion of this system would result in large sums of money being generated.

1. The ARRL, by Minute 63, chartered a committee to make recommendations regarding introduction of digital modes into the amateur bands. There was to be another committee chartered under Minute 64 to propose recommendations for a band plan based on emitted bandwidth. An Ad Hoc HF Digital committee was appointed to deal with Minute 63, and for that purpose needed to be composed of experts in the digital field. This committee went beyond its charter and also dealt with Minute 64 so you then had a group of digital experts attempting to speak for all other amateur interest groups that they were not appointed to represent.

In spite of this ARRL states in RM-11306, that they were "guided" by the recommendations of this committee. They were indeed "guided" for if the recommendations of the committee are compared to the provisions of RM-11306, it will be seen that they are virtually the same.

It must be noted that all was not well within this 6-member committee. One member resigned in disgust and

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another felt compelled to submit a dissenting recommendation. This dissenting recommendation was presented in March of 2003. In August, ARRL published on its website the report of the Ad Hoc committee but the dissenting recommendation was not posted. Even now, three years later, and after repeated pleas by members, the document has still not been posted on the ARRL website, even though it is an official part of the Ad Hoc committee report. A copy was somehow obtained and posted on the zerobeat.net website in September 2004. It is must reading for anyone pondering RM-11306, and its content and attempted suppression are responsible for a large part of the discontent that still exists in the amateur community over the pending ARRL petition.

A copy of the dissenting recommendation is attached hereto as enclosure 1.

2. In 1995 FCC allocated 3.8% of amateur HF spectrum to subbands. Winlink, as the major user of the subbands, now represents only 0.7% of FCC-licensed radio amateurs. It would seem that granting 3.8% of the amateur spectrum for automatic wideband digital operations, useful to only 0.7% of our amateur population is already being overly generous. Yet the petition is proposing doing away with the requirement that automatic wideband digital modes remain in the subbands and allowing so-called "semi-automatic" wideband digital operation to take place over much more of the available amateur spectrum.

There is no significant difference in practice between the ARRL-defined "semi-automatic" operation and fully automatic operation, because the operator of a "semi-automatic" station always turns it into a fully automatic station, under software control, when he initiates the interrogation of the automatic station. During the interrogation process, it is impossible for any third party to interrupt that process to advise the operator of the "semi-automatic" station that the frequency is already occupied.

3. The majority of hams still see amateur radio as a hobby, not a radio Email service, and prefer to spend their time working CW and analog SSB. This number may be dwindling (?) but any modifications to the rules should be done with first regard for this majority that still prefers to communicate using voice or CW.

4. In RM-11306 ARRL infers that portions of the current

regulatory process are cumbersome and inflexible.

In my view it is proper that the regulatory process be deliberate, methodical, and always guided by a steady hand. As to flexibility, the current STA procedure provides ample opportunity for experimentation with new modes. The STA process is essential to guarantee the radio amateur's right to due process and of public comment on an NPRM before allowing the unrestricted use of any mode that could be harmful to other communications.

The possibility that through deregulation and voluntary bandplans our hobby might generate into another CB-type operation chills the heart of this old man, who has been hamming for 65 years, and has been an ARRL member and supporter most of this period.

5. Current regulations require sharing of frequencies but this is impossible in cross-mode situations because the two modes simply do not understand each other. When one is an audio mode and one is a visual mode it will be very difficult to resolve the interference problem that will inevitably arise.

6. It is troubling to me that a large part of the digital traffic in the ham bands is Email transfer, and when this is coupled with automatic control, the door is open for all sorts of abuses. Since the protocol used is equivalent to encryption, profanity, obscenity, business transactions, even terrorist traffic can readily appear on the ham bands and go undetected by others.

I recommend the following:

A. Reject RM-11306, or,

B. Accept RM-11306 in part, amending the proposed rewording of Section 97.221 to read as follows:

97.221 Automatically controlled stations transmitting RTTY or data emission.

(b) A station may be automatically controlled while transmitting a RTTY or data emission on the 6 meter or shorter wavelength bands, and on the 28.120-28.189 MHz,

21.150-21.160 MHz, 14.100- 14.112 MHz, 10.140-10.150 MHz, 7.100-7.105 MHz, or 3.620-3.635 MHz segments.

This would keep all stations interrogating automatic stations and all automatic stations themselves clustered in contiguous, clearly defined areas (subbands) so others would know where they were and could avoid them.

This will be vigorously opposed by proponents of automatic operation, because an ARQ system is not successful in overcoming interference from another ARQ system as both systems will automatically attempt to dominate the frequency with the result that neither is able to successfully use the frequency. For this reason, they do not wish to be confined to areas where they encounter other ARQ system. They would much prefer to operate in areas where the interference does not "fight back", such as the live QSO part of the band. This concept was explored in depth in an Op-Ed article in the September 2002 issue of QST, authored by Skip Teller (KH6TY) with assistance from Peter Martinez (G3PLX). A copy of this article is attached hereto as enclosure 2.

Respectfully,

George E. Foy
George E. Foy, NK4Q

Enclosure (1) Ad Hoc HfDigital Committee Dissenting Recommendation

Enclosure (2) Op-Ed article from September 2002 QST

Report of the ARRL Ad Hoc HF Digital Committee

Dissenting Recommendation

Prepared by Committee Member Howard Teller, KH6TY

Why is a dissenting recommendation necessary?

The majority recommendation of the ARRL hfdigital committee represents the interests of a small special interest group, Winlink, representing 0.7% of the FCC licensed radio amateurs in the United States, and NOT the interests of ALL radio amateurs, as requested by ARRL president, Jim Haynie.

The ARRL hfdigital committee majority recommendation [hfdigital:284] was composed and written jointly by the Winlink author, W5SMM, and the Winlink Network Administrator, K4CJX, and then rubber-stamped, without comment except for typo corrections, by the Winlink supporters on the committee, WA1LOU and K0PFX. All alternative recommendations were totally ignored by the chairman and Winlink supporters. At no time during the committee discussions did WA1LOU or K0PFX submit any independent comments or suggestions except for corrections. The chairman of the committee, who is also the Winlink software author, consistently shut off discussion prematurely and forced a vote, which was naturally won by the Winlink majority, eventually resulting in the resignation of the widely respected Peter Martinez, G3PLX, in protest for having his views silenced.

The committee majority recommendation therefore represents the views of a special interest group, and NOT the interests of *all* radio amateurs.

This dissenting recommendation is submitted as a recommendation that at least attempts to consider the needs of ALL radio amateurs, including Winlink.

Introduction

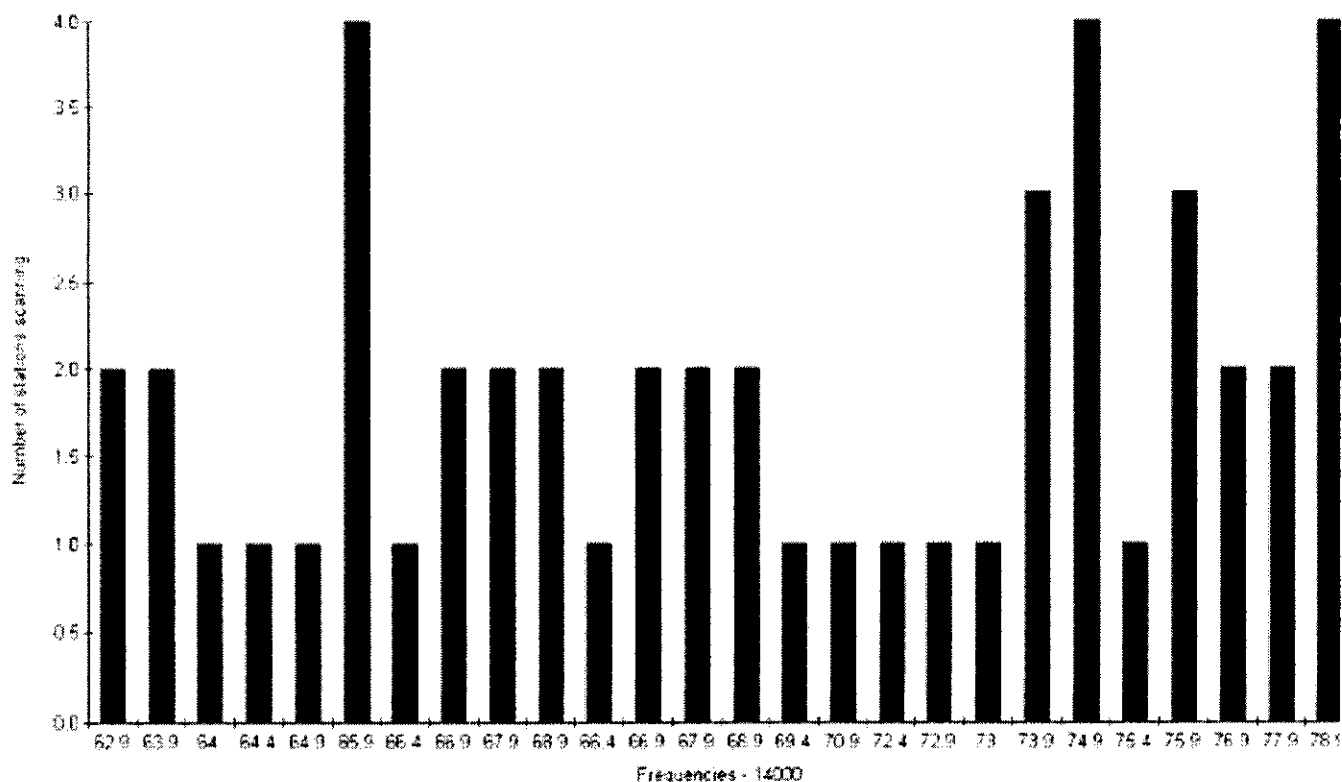
Winlink consists of a network of fully automated digital transceivers, providing free email gateways to the Internet using the ham bands in competition with commercial LEO satellite services which do the same thing, but charge for messaging on a per-minute basis.

This network of fully automated transmitters is causing historically high levels of interference to all other radio amateur activities on HF because the automated side

of an email gateway is incapable of "listening first", or frequency sharing, as radio amateurs usually do, and are required to do, by FCC regulation, and the other side, which is supposed to be manned by a "listen first" live operator, finds it unnecessary to be concerned about anyone else already on the frequency, because the protocol chosen by Winlink is capable of overpowering anyone else on the frequency, and keep hammering away using ARQ until the Winlink station dominates the frequency. The result is high levels of QRM to all others. In addition, the manual stations escape detection by never transmitting any callsign identification in case they try to connect with an automatic station and fail. They just create QRM and leave the air unidentified.

The majority recommendation proposes to expand this network of robot transmitters to completely cover the ham bands without restriction, including the phone band segments, with the exception of the CW and beacon regions. This chart of the current coverage of the 20 meter band by Winlink robots indicates why interference by these robots is so high and currently disrupts so many other traditional radio amateur communications. It is easy to visualize what it would be like if the majority recommendation were accepted by the Board. There would be no space left on the HF bands for ragchewing, DX chasing, award-chasing, contesting, or experimentation, free from constant interference from Winlink robot stations, such as suffered currently by digital operators, and more recently, on 30 meters by CW operators, who find it more and more difficult to operate without a Pactor station suddenly coming on the frequency in the middle of their QSO.

Winlink 2000 20m Pactor-II Coverage



Recommendations

The hfdigital committee was chartered to address *only* Minute 63 as follows:

"Minute 63. On motion of Mr. Frenaye, seconded by Mr. Bodson, it was unanimously VOTED that the President is authorized to appoint an ad hoc working group to study the new HF data modes in the Amateur Radio Service. The Terms of Reference are to develop recommendations for introduction of voice-bandwidth data modes and to advise the board on amateur-Internet linking and HF automatic control with a final report to the Board by January 2003."

Recommendation for Introduction of Voice-bandwidth data modes

It is recommended that voice-bandwidth data modes NOT be introduced, nor even allowed, on the crowded HF bands, except for digital voice applications, because they unnecessarily use a disproportionate amount of bandwidth for the benefit of a faster data rate.

Data provided by the Winlink Administrator for the first three weeks of 2003, in which 13,182 emails were transferred by Pactor 1 and Pactor 2, which are 500 Hz wide, compared to 5,745 emails transferred by Pactor 3, which is 2400 hz wide, or "voice-bandwidth", shows only a 30% savings in time using a voice-bandwidth data mode, which uses 500% more space, than using a 500 Hz-wide data mode, such as Pactor 2:

Pactor 1 or Pactor 2

3631.9	2.9
7076.9	2.7
10123.9	1.9
14076.9	1.7
18103.9	1.7

Total 10.9

Avg: 2.18 minutes/message for Pactor 1/2 over 13,182 messages

Pactor 3

7103.7	1.8
10141.2	2.5
14106.7	1.3
18108.7	1.2

Total 6.8

Avg: 1.7 minutes/message for Pactor 3 over 5,745 messages

Therefore, voice-bandwidth data modes are an inefficient use of the spectrum for average-length email transfers, such as those handled daily by Winlink.

The only other known use for voice-bandwidth data modes is for image transfers, which is understandable, as images are known to utilize large amounts of data. The only currently known voice-bandwidth image data mode is HDSSTV, which can send an SSTV-size picture, with a very low error rate, in 30 seconds, using a bandwidth of 2400 Hz. However, the HDSSTV software author has confirmed that the same image, at the same low error rate, can be sent in less than 2 minutes, using a bandwidth under 500 Hz.

In other words, just by accepting to wait longer for an image to arrive, as is the current practice in SSTV, *it is not necessary to use a voice-bandwidth transmission mode.*

Since space is at a such premium on the crowded HF bands, it is irresponsible to use voice-bandwidth data modes which serve merely to reduce waiting time, either for image transfer, or email transfer, because it deprives other users of other modes of space in which to operate. The VHF or UHF bands are a more appropriate place to use voice-bandwidth data modes, as is ATV, which requires so much bandwidth it is only allowed on the UHF bands, where space is not at such a premium.

Recommendation: Voice-bandwidth data modes SHOULD NOT be introduced on the HF bands.

Amateur-Internet Linking

Recommendation: The current FCC regulations regarding amateur-internet linking are adequate, and no changes are necessary. The dissenting recommendation is in agreement with the majority recommendation on this issue.

HF Automatic Control

HF automatic control needs to be confined to a single, contiguous, space on the bands where the automatic robot stations can be avoided by others and where they do not cause interference to others.

If it is agreed that voice-bandwidth data modes should not be used because they are an inefficient use of bandwidth for email transfers, then the current FCC-allocated sub-bands for automatically controlled digital stations are adequate for the current level of automated email gateway operations, if networks, such as Winlink, make any serious attempt at all in efficiently utilizing frequencies on a first-come-first-serve basis.

Winlink professes to be the largest email gateway network in the world, and it numbers only 4,500 users out of 660,000 FCC licensed radio amateurs, or 0.7%. Any HF spectrum space reserved for activities such as WINLINK should be proportional to their population size as compared to the total amateur population desiring to use the same spectrum for other purposes. The current FCC sub-bands for automatically controlled digital stations on 20 meters is currently accepted by all IARU regions, and provides even more space than the proportion of automated network users on HF would ordinarily be entitled to.

Recommendation: Stations using Automatic Control on the HF bands should be confined to the current FCC sub-bands for automatically controlled digital stations and FCC regulation 97.221(c) should be repealed to prevent the robot stations from spreading randomly all over the bands where they can create interference to others trying to use the bands for traditional ham radio activities.

Notes

It is highly improper to exceed the charter of the committee, so this dissenting recommendation provides no bandplan recommendation.

However, the majority recommendation does include a bandplan as Appendix A, which *seriously misrepresents* the Region 1 proposed bandplan, presented to the committee by Dave Sumner, K1ZZ, *by conveniently omitting remarks and limitations* which confine store-and-forward operations, such as Winlink, to the FCC-defined sub-band for automatically controlled digital stations on the 20m band and completely bans those operations on the 160m, 40m, and 30m bands, and then declares that the majority recommendation "harmonizes where possible" with the latest proposed Region 1 bandplan.

It is clear that the majority bandplan submission is really a veiled attempt by Winlink to gain ARRL support for Winlink robot transmitters operating all over the HF bands and therefore *should be disregarded*.

Recommendations:

Submission of such a bandplan is clearly outside the charter of the hfdigital committee, and should be left up to a new committee, officially chartered to address Minute 64, which must consist of members representing the entire range of operating interests - CW, data, and phone - and not dictated by a committee already unbalanced in favor of a special interest group.

The ARRL Board should be promoting bandplans that encourage the development of more spectrum-efficient modes, such as PSK31 and MFSK16, which accomplish the essential task of communications in less bandwidth, as opposed to promoting wider data modes which add to the interference and congestion on HF bands instead of reducing it.

Howard Teller
March 23, 2003

Zerobeat - Zerobeat Discussion Forum - ARRL Band Plan Proposal - ARRL Divisions-Contact YOUR director

If the ARRL has its way, you'll hear a lot of this in the bands!

A Solution to HF Digital Chaos?

Skip Teller, KH6TY
335 Plantation View Ln
Mt Pleasant, SC 29464
hteller@comcast.net

RTTY first appeared on the HF bands in the 1950s and has always been a "live" mode, with the operators sitting in front of their teletype machines, or more likely these days in front of their computer keyboards. In the '80s, when error-correcting modes such as AMTOR and AX.25 packet radio appeared, some amateurs saw the possibility for using computers for automatic message handling. Since then, activity on digital modes has been split between the mainstream "live QSO" fraternity and those who saw digital modes as a means to get messages from A to B, with unattended HF mailboxes as the key components in the link. Nowadays most of the HF mailboxes are using various forms of PACTOR rather than the earlier AMTOR and AX.25 modes. Networks such as Winlink 2000, for example, provide a valuable service by making it possible for hams in remote locations to exchange e-mail with the Internet.

However, live and automated HF digital activities are increasingly in conflict. A live-QSO operator will establish that a channel is clear by listening before calling, whereas a mailbox has no way of doing this. Although some mailboxes have a "busy channel detector" to detect another signal of the same type already on a frequency, these devices don't work well if there is some other type of signal present, and this often results in interference. The error-correction (ARQ) techniques in use by these mailboxes do not suffer major disruption from such interference, just a slowing down of the store-and-forward process. But the live-QSO operators get understandably angry when their real-time two-way conversations are disrupted by a mailbox that "doesn't listen first." This conflict is not just competition for spectrum space. It's a fundamental incompatibility between different ways of using the spectrum.

Both the FCC and the IARU have tried to solve this problem by placing mailboxes in one part of the digital sub-bands and live operators in the other. This worked while the majority of mailbox activity was AX.25, but the PACTOR stations never embraced this scheme. Today there are few PACTOR mailboxes that operate in the section allocated for automatic activity—they are spread over the whole of the rest

of the data sub-bands and the level of interference is now higher than ever. The present rules are ineffective.

If one asks the average PACTOR mailbox operator why he won't use the automatic sub-bands along with the remaining automated AX.25 packet stations, he will typically reply, "You wouldn't like to suffer interference from AX.25, so why should we?"

To understand the reasoning behind this response, it is necessary to study how ARQ systems handle interference. If the interference is due to natural causes like fading or noise, the link halts briefly then carries on. Even random man-made interference only causes pauses in the traffic and the slowdown factor is tolerable. But if the interference persists, the ARQ link keeps repeating until the interference stops. Worse still, if the interference tries to continue until the ARQ link itself stops, then the slowdown factor becomes rapidly worse. Here then is the real reason why ARQ mailbox operators are reluctant to share spectrum with AX.25 packet. *ARQ is not good at fighting interference that fights back.*

This is not only true for an ARQ link suffering interference from AX.25 packet; it's actually worse for an ARQ link suffering interference from another ARQ link. Because of this, ARQ systems have naturally tended to spread out so that no mailbox will suffer interference from another, particularly over the part of the band where the expected interference does not "fight back," namely the "live-QSO" part of the band. No matter where two live operators start a two-way conversation on a clear channel, there will always be a chance that it will be hit by an automatic ARQ system.

Note that the AX.25 packet protocol has the "back-off" feature that allows several AX.25 links to equitably share a channel, so AX.25 mailboxes are happy to operate in a bunch. The above analysis explains why ARQ mailboxes will always prefer to spread out and why they dislike the "automatic" sub-bands.

The present situation, in which the majority of live-QSO operators are subjected to interference from a small minority of unattended mailboxes, cannot be allowed to continue. The problem can be solved if the ARQ mailbox fraternity can accept that it has to find ways for ARQ systems to operate in the presence of interference from their own kind. This could take the form of a much higher use of "busy channel detect" devices, or simply

to program them not to keep repeating when there is persistent interference, but to quickly abort a stalled link and try again later, in a process equivalent to the AX.25 back-off protocol. Such techniques could enable them to operate in a contiguous group of shared channels rather than on a one-per-channel basis; that is, with their total traffic load concentrated into a much smaller number of fully loaded channels rather than spread thinly across the digital sub-bands. With the automatic sub-bands being busy most of the time, the live-QSO operators will know to keep away and will not therefore either suffer or cause interference. The present automatic sub-bands, which are now very little used by AX.25 packet, can easily accommodate the expected traffic levels.

This proposal, if embraced by the mailbox fraternity, could enable the present problem to be solved without any changes to the present ineffective rules.

I would like to thank Peter Martinez, G3PLX, for his invaluable assistance in preparing this editorial.

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The purpose of Op-Ed is to air member viewpoints that may or may not be consistent with current ARRL policy.

1) Contributions may be up to two-thirds of a QST page in length (approximately 900 words).

2) No payment will be made to contributors.

3) Any factual assertions must be supported by references, which do not necessarily have to be included in the body of the article to be published.

4) Articles containing statements that could be construed as libel or slander will not be accepted.

5) The subject matter chosen must be of general interest to radio amateurs, and must be discussed in a way that will be understandable to a significant portion of the membership.

6) With the exception that the article need not be consistent with League policy, the article will be subject to the usual editorial review prior to acceptance.

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